REMARKS

Claims 1-10 and 21-30 were presented.

The Office Action indicates that claims 21-30 are subject to a Restriction Requirement, which is made final. Applicant does not acquiesce to the Restriction Requirement.

Claims 1-4, 6, 8, and 10 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,199,000 to Keller et al. (hereinafter "Keller"). Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Keller. Claims 5 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Keller in view of U.S. Patent No. 5,947,347 to Nelson (hereinafter "Nelson").

Claims 1-10 were additionally provisionally rejected over a co-pending application of the present inventor, Application Serial No. 10/631,465, under the judicially created doctrine of obviousness-type double patenting.

Claims 1-10 were additionally provisionally rejected over a co-pending application of the present inventor, Application Serial No. 10/401,266, under the judicially created doctrine of obviousness-type double patenting.

Claim 1 has been amended to recite, in relevant part, the limitations of:

> an electronic compass module in electrical communication with said control module, wherein said electronic compass module is configured to discern an orientation relative to the magnetic field of the planet Earth; and
>
> an environmental signal detection module in electrical communication with said control module, wherein said environmental signal detection module is configured to detect an environmental signal of terrestrial origin that is provided for purposes of communication and to discern at least one of a location and an orientation of said programmable robotic apparatus.

Support for the electronic compass module is found in the Specification at least at paragraph [0062] and in Fig. 6. The environmental signal detection module is described at paragraph [0009] as being configured to detect signals from any of a cellular telephone communication antenna, a radio broadcast antenna, and a television broadcast antenna, which are examples of terrestrial signal sources that are provided for purposes of communication.

Claim 7 has been amended to limit the specific kinds of environmental signals of terrestrial origin to one of a cellular telephone communication antenna, a radio broadcast antenna, and a television broadcast antenna.

No new matter is introduced by the amendments.

Response to Rejection of Claims 1-4, 6, 8, and 10 under 35 U.S.C. §102(b)

Claims 1-4, 6, 8, and 10 were rejected under 35 U.S.C. §102(b) as being anticipated by Keller. Keller teaches a system that depends on the GPS system of satellites that are geosynchronous, or their equivalents provided as land-based transmitters (pseudolites).

In particular with respect to Claim 1, the Examiner has indicated the disclosure of Keller at column 4, lines 55-67 as anticipating the environmental signal detection module element of claim 1.

However, as presently amended, Claim 1 recites, in relevant part,

> an electronic compass module in electrical communication with said control module, wherein said electronic compass module is configured to discern an orientation relative to the magnetic field of the planet Earth; and
>
> an environmental signal detection module in electrical communication with said control module, wherein said environmental signal detection module is configured to detect an environmental signal of terrestrial origin that is provided for purposes of communication and to discern at least one of a location and an orientation of said programmable robotic apparatus.

The present application published on July 8, 2004 as United States Patent Application Publication No. 20040133316. The term "environmental signal" is discussed at paragraph [0030] and includes many kinds of signals "that occur in the environment without any action on the part of the robot or its operator, in analogy to the magnetic signals present as a consequence of the magnetic properties of the planet Earth." Some environmental signals are generated by terrestrial objects, and others are generated by objects that are not confined to the planet Earth. As presently amended, claim 1 includes the limitation that the environmental signals are "of terrestrial origin that is provided for purposes of

communication" which would exclude such signal sources as GPS satellites in orbit around the planet Earth, and pseudolites.

Applicant respectfully submits that Keller does not teach or suggest the use of "an electronic compass module in electrical communication with said control module, wherein said electronic compass module is configured to discern an orientation relative to the magnetic field of the planet Earth; and an environmental signal detection module in electrical communication with said control module, wherein said environmental signal detection module is configured to detect an environmental signal of terrestrial origin and to discern at least one of a location and an orientation of said programmable robotic apparatus."

In contradistinction to the magnetic field of the planet Earth or terrestrial radio signals such as cellular telephone, radio, or television signals, conventional GPS systems use an extremely accurate time base, in order to make corrections for the time required for man-made, typically digital, signals to propagate in space from their source in a transmitter to the receiver that attempts to determine its location relative to the man-made signal source. One can review the disclosure of U.S. Patent No. 5,931,889, issued August 3, 1999 to Misra, and entitled "Clock-aided satellite navigation receiver system for monitoring the integrity of satellite signals," to understand how the identification of a plurality of sources and the received information are utilized in GPS-type systems. Applicant's attorney is familiar with U.S. Patent No. 5,931,889.

The title of Keller is "Methods and Apparatus for Precision Agriculture Operations Utilizing Real Time Kinematic **Global Position System** Systems." (emphasis added) Keller teaches the use of satellite-based transmitters to allow a device to determine its position with respect to those transmitters, and hence to deduce its location on the Earth's surface. In particular, Keller recites, at column 4, lines 25-54, various systems that are intended for use in the methods taught by Keller. Applicant will refer generally to the systems so described by Keller as "GPS" systems.

> Moreover, although the various methods and apparatus will be described with particular reference to GPS satellites, it should be appreciated that the teachings are equally applicable to systems which utilize pseudolites or a combination of satellites and pseudolites. Pseudolites are ground- or near ground-based transmitters which broadcast a pseudorandom (PRN) code

> (similar to a GPS signal) modulated on an L-band (or other frequency) carrier signal, generally synchronized with GPS time. Each transmitter may be assigned a unique PRN code so as to permit identification by a remote receiver. **Pseudolites are useful in situations where GPS signals from an orbiting satellite might be unavailable, such as tunnels, mines, buildings or other enclosed areas or in areas of significant foliage.** The term "satellite", as used herein, is intended to include pseudolites or equivalents of pseudolites, and the term GPS signals, as used herein, is intended to include GPS-like signals from pseudolites or equivalents of pseudolites. (emphasis added)
>
> It should be further appreciated that the methods and apparatus of the present invention are equally applicable for use with the GLONASS and other satellite-based positioning systems. The GLONASS system differs from the GPS system in that the emissions from different satellites are differentiated from one another by utilizing slightly different carrier frequencies, rather than utilizing different pseudorandom codes. As used herein and in the claims which follow, the term GPS should be read as indicating the United States Global Positioning System as well as the GLONASS system and other satellite- and/or pseudolite-based positioning systems.

A pseudolite is a ground-based differential GPS transmitter that simulates the signal of a GPS satellite and can be used for ranging. The word "pseudolite" is a shortened form of pseudo-satellite.

In the text cited above, Keller is clearly contemplating a system of broadcast data that requires a user to receive information from and to individually identify a plurality of sources of the broadcast data for purposes of locating an object, rather than signals broadcast for purposes of communication, such as telephone, radio, and television signals.

Keller teaches the use of additional location systems to supplement the use of the "GPS" systems taught at column 4, lines 25-54. At column 4, line 55 through column 5, line 3, Keller describes these supplemental systems:

> In addition, the precision agriculture methodologies and accompanying methods and apparatus described herein **may be supplemented** with non-satellite based guidance systems, such as inertial navigation systems, distance and gyro compass and/or other heading and/or attitude indicator systems (e.g., accelerometer-based yaw, pitch and/or roll sensors), laser range finding and bearing indicator systems, etc. The use of such systems to assist in terrestrial navigation is well known in the art and will not be described further so as not to unnecessarily obscure the following discussion. **It should be recognized that such systems could supplement** (at least to some degree) **the GPS-**

> **based systems** described in detail below **and would be particularly useful, for example, in situations where satellite-based positioning signals are unavailable** (e.g., under foliage, behind hills or buildings, in valleys, mines, etc.). (emphasis added)

Keller never explicitly describes the magnetic field of the planet Earth as a suitable signal from which to derive a location or a direction. Furthermore, from the disclosure of Keller cited above, it is clear that "GPS" systems are the primary locating system used in the invention of Keller, and other systems are provided as SUPPLEMENTAL systems, and not as the principal navigational system of Keller's invention. Keller does not teach or suggest how a system would operate without the "GPS" system he uses as the primary locating system, nor does Keller explain how to use such a system in the absence of the primary "GPS" system.

The Specification of the present application clearly describes an electronic compass module that is configured to discern an orientation relative to the magnetic field of the planet Earth. The Specification of the present application also clearly describes environmental signal detector modules that are configured to discern an orientation and or a location relative to environmental signals. Applicant submits that discerning an orientation relative to a naturally occurring field, such as the Earth's magnetic field, is different from the use of one or more man-made systems that broadcast signals. For one thing, there is no identification of the Earth's magnetic field using a pseudorandom code such as the PRN described by Keller.

When Keller uses the word "compass," it is either in the form "gyro compass" (see column 4, line 58; column 14, line 7) or "compass rose" (see column 9, line 13). Keller does not make any reference to an "electronic compass," or simply a "compass" without a modifier. A gyro compass is used for inertial navigation. A compass rose is the typical 4- or 8- pointed figure used to show compass headings, for example on a map.

Because Keller fails to teach or suggest "an electronic compass module in electrical communication with said control module, wherein said electronic compass module is configured to discern an orientation relative to the magnetic field of the planet Earth; and an environmental signal detection module in electrical communication with said control module, wherein said environmental signal detection module is configured to detect an environmental

signal of terrestrial origin and to discern at least one of a location and an orientation of said programmable robotic apparatus," Keller fails to anticipate independent Claim 1 as presently amended. Applicant respectfully submits that independent Claim 1 is patentable over Keller. Applicant further submits that Claims 2-10 and 21-30 which depend from independent Claim 1 are patentable as depending from an allowable base claim.

Response to Rejection of Claim 7 under 35 U.S.C. §103(a)

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Keller. The argument presented by the Examiner is that, while Keller fails to teach or suggest "the orientation relative to the magnetic field of the planet earth [sic]" Keller teaches at column 4, lines 56-61 "the possible use of different compass to be used."

Claim 7 as presently amended recites "[t]he programmable robotic apparatus of Claim 1, wherein said environmental signal detection module is configured to discern at least one of a location and an orientation relative to at least one of a cellular telephone communication antenna, a radio broadcast antenna, and a television broadcast antenna.

Applicant does not understand how the Examiner's argument applies to Claims 7. Even if it does, by the Examiner's admission, Keller fails to teach the orientation relative to the planet Earth. The magnetic compass element of claim 1 is also present in claim 7, because claim 1 depends from claim 1.

Turning to the substance of the Examiner's argument about compasses other than the electronic compass recited in claim 1, at column 4, lines 56-61, Keller describes these supplemental systems:

> In addition, the precision agriculture methodologies and accompanying methods and apparatus described herein **may be supplemented** with non-satellite based guidance systems, such as **inertial navigation systems**, distance and **gyro compass** and/or other heading and/or attitude indicator systems (e.g., accelerometer-based yaw, pitch and/or roll sensors), laser range finding and bearing indicator systems, etc. (emphasis added)

Applicant submits that a gyro compass is a form of inertial navigation system that operates without regard to signals from sources external to the object that contains the gyro compass. The construction and use of a gyrocompass is explained in the literature.

The following is an excerpt from the article "compass." *Encyclopædia Britannica* from Encyclopædia Britannica Premium Service located at <http://www.britannica.com/eb/article?tocId=9025014> [Accessed March 2, 2005].

> **Gyroscopes are also employed in a type of nonmagnetic compass called the gyrocompass.** The gyroscope is mounted in three sets of concentric rings connected by gimbals, each ring spinning freely. When the initial axis of spin of the central gyroscope is set to point to true north, it will continue to do so and will resist efforts to realign it in any other direction; the gyroscope itself thus functions as a compass. If it begins to precess (wobble), a pendulum weight pulls it back into line. Gyrocompasses are generally used in navigation systems because they can be set to point to true north rather than to magnetic north. (emphasis added)

The following is an excerpt from the article "navigation." *Encyclopædia Britannica* from Encyclopædia Britannica Premium Service located at <http://www.britannica.com/eb/article?tocId=61207> [Accessed March 2, 2005].

> **The gyrocompass is independent of the magnetic field of the Earth** and depends upon the properties of the gyroscope and upon the rotation of the Earth. (emphasis added)
>
> The axis of a free gyroscope will describe a circle around the pole of the heavens. To convert it into a gyrocompass, a control must be introduced that, when the axis tilts, will operate to precess (turn) it toward the meridian. The case of the gyroscope is made pendulous, or a liquid is arranged to flow from side to side. Either will convert the path traced by the axis into an ellipse. By delaying the flow of the liquid or by making eccentric the point of action of the control, a damping factor is introduced that converts the ellipse into a spiral so that the gyrocompass finally settles pointing true north.

Applicant submits that there are considerable differences between a gyrocompass and an electronic compass operating in response to the magnetic field of the plant Earth, as the cited information from the *Encyclopædia Britannica* indicates. Nothing in Keller indicates the use of a magnetic compass.

Claim 7 depends from claim 1. Therefore, every limitation of claim 1 is an element of claim 7. Since Keller does not teach or suggest the compass limitation of claim 1, as presently amended, nor does Keller teach or suggest an "environmental signal detection

module is configured to detect an environmental signal of terrestrial origin that is provided for purposes of communication," Keller cannot teach or suggest either the compass limitation or the environmental signal of terrestrial origin limitation of claim 1, and therefore, claim 7 is allowable over Keller.

Response to Rejection of Claims 5 and 9 under 35 U.S.C. §103(a)

Claims 5 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Keller in view of Nelson.

Claim 5 recites in relevant part "wherein said programmable robotic apparatus is a programmable lawn mower." The Examiner concedes that Keller does not describe a programmable lawn mower. In fact, Keller, at column 6, lines 2-6, describes extremely high precision locating systems, e.g., to accuracies of centimeters, for use with agriculture operations for seeding, cultivating, planting and/or harvesting. See also the Abstract of Keller.

> However produced, the map should be of sufficient resolution so that the precise location of a vehicle within the area defined by the map can be determined to a few centimeters with reference to the map.

The Examiner has attempted to combine the teachings of Keller with those of Nelson. Nelson describes a lawnmower that uses a loop antenna to receive signals from a plurality of transmitters placed in a known configuration. Lawn mowing systems generally do not require precision to within a few centimeters. Accordingly, the Examiner has not pointed to a teaching that would serve to motivate the combination of Keller and Nelson. The attention of the Examiner to the holdings of *In re Werner Kotzab*, 217 F.3d 1365 (CAFC, 2000) is respectfully requested. Applicant does not concede that Keller and Nelson can be properly combined.

Whether or not Keller and Nelson can be combined, Nelson fails to teach or suggest "an electronic compass module in electrical communication with said control module, wherein said electronic compass module is configured to discern an orientation relative to the magnetic field of the planet Earth."

Claim 5 depends from Claim 1 through Claim 3. Therefore, every limitation of Claim 1 is an element of Claim 5. Since neither Keller nor Nelson individually teaches or suggests the compass limitation of Claim 1, as presently amended, neither Keller nor Nelson nor the combination of Keller with Nelson (if such combination were to be properly motivated) can teach or suggest the compass limitation of Claim 1, and therefore, Claim 5 is allowable over the combination of Keller with Nelson.

Claim 9 recites, in relevant part, "wherein said command receiver module is configured to receive signals from a portable transmitter."

Claim 9 depends from Claim 1 through Claim 8. Therefore, every limitation of Claim 1 is an element of Claim 9. Since neither Keller nor Nelson individually teaches or suggests the compass limitation of Claim 1, as presently amended, neither Keller nor Nelson nor the combination of Keller with Nelson can teach or suggest the compass limitation of Claim 1, and therefore, Claim 9 is allowable over the combination of Keller with Nelson.

Response to Provisional Obviousness-Type Double Patenting Rejection

Claims 1-10 were additionally provisionally rejected over a co-pending application of the present inventor, Application Serial No. 10/631,465, under the judicially created doctrine of obviousness-type double patenting.

Claims 1-10 were additionally provisionally rejected over a co-pending application of the present inventor, Application Serial No. 10/401,266, under the judicially created doctrine of obviousness-type double patenting.

In view of the fact that at the present time there are no claims that have been deemed allowable in Application 10/631,465, and an Office Action is presently outstanding in Application Serial No. 10/401,266, in which all claims but one stand rejected, and one claim is objected to, Applicant submits that there is presently no need for the submission of a terminal disclaimer. In the event that there is allowable subject matter in the present application, and there is a *bona fide* basis for a double patenting rejection thereof, Applicant will provide a suitable terminal disclaimer. Applicant is unwilling to provide a terminal disclaimer in the absence of allowable subject matter, because the subject matter to be

disclaimed is unknown in the absence of such allowable matter, and an informed disclaimer is not possible. Applicant is not prepared to issue what would in the present circumstance be the intellectual equivalent of a "blank check."

CONCLUSION

Applicant submits that the Restriction Requirement is improper and that claims 21-30 are properly to be considered as pending in the application. In that event, Applicant further submits that the Office Action mailed on December 14, 2004 is improper as failing to deal with all the pending claims in the application.

Applicant submits that Claims 1-10 and 21-30 are now in proper condition for allowance, and requests the issuance of a Notice of Allowance at the Examiner's earliest convenience.

If the Examiner believes that contact with Applicant's attorney would be advantageous toward the disposition of this case, the Examiner is requested to call Applicant's attorney at the phone number noted below.

Respectfully submitted,
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